

TRIGLOCHIN.

T. maritima L. Salt marshes, common. This species was collected by Wm. Boott on the "Brookline R. R." on May 26, 1854.

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NOTE ON THE MORPHOLOGY OF THE FRUIT OF LONICERA CAERULEA.

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It seems strange that such a widely distributed and well known plant as *Lonicera caerulea* should be so little known in regard to the morphological structure of its fruit, that even in the most recent manuals and floras as well of this country as of Europe the description of the ovaries and fruits is incorrectly given. The fruit is described everywhere as consisting of two connate berries, but a dissection will show at once, even without the aid of a magnifying glass, that this is not the case; the ovaries are entirely separated from each other and remain so until maturity, the bractlets, however, are united into a cupula tightly enveloping the ovaries the whole thus presenting the appearance of perfectly united ovaries without bractlets which in fact are generally described as wanting.

There have been a few botanists who described correctly the ovaries and fruits of this *Lonicera*, but their statements were overlooked and the old erroneous conception based on superficial observation has remained the current one until today. The first correct description as far as I know was given by Petermann in 1849 (*Deutschlands Flora* 260, pl. 41, fig. 323, R-T) as follows: Die vier Deckblättchen zu einer die zwei Fruchtknoten eng und gänzlich umschliessenden und endlich zugleich beerenartig werdenden Hülle verwachsen und so nur einen Fruchtknoten darstellend [The four bractlets connate into a cupula enclosing tightly and completely the two ovaries and finally becoming

berrylike, thus simulating only one ovary]; the accompanying figures give a fair illustration of these facts. All of the later writers seem to have overlooked Petermann's statement, until in 1893 Koehne in his *Deutsche Dendrologie* 545, fig. 96, K) again describes and figures correctly the ovaries apparently without knowing of Petermann's publication; one of his drawings had been published already two years before in Engler & Prantl's *Natürliche Pflanzenfamilien* (Teil 4, Abteil. 4, p. 167, fig. 57, E), but in the accompanying text Fritsch describes the berries as completely connate. In 1903 I described and figured the fruit in my *Synopsis of the genus Lonicera* (Rep. Missouri Bot. Gard. XIV. 67, pl. 1, fig. 10-11). Maximowicz in his revision of the *Loniceras* of Eastern Asia (Bull. Acad. Sci. St. Pétersb. XXXI, 58. 1886) observed the true state of the fruit of *Lonicera caerulea* in a Japanese form, but failed to recognize its identity with *L. caerulea* which he describes in the usual way as having connate ovaries, and published this Japanese form on account of its peculiar bracts as a new species under the name of *L. emphylocalyx*, the name apparently referring to the large bractlets enclosing the ovaries up to the calyx.

The true character of the fruit is also disclosed by a variety named by Regel *L. caerulea* var. *angustifolia* (Russkaya Dendr. 144. 1873) which shows the tendency at least in the plant cultivated at the Arnold Arboretum, to have the cupula more or less distinctly lobed and sometimes shorter than the ovaries so as to expose partly the latter. We have here again a case where a teratological aberration reveals the true morphological character of parts whose morphological origin seems doubtful.

Lonicera caerulea is the only species of the whole genus containing about 165 species in which the cupula grows with the ovaries into a collective fruit and becomes juicy and colored at maturity. It forms thus a very distinct group by itself. In the allied section *Chlamydocarpi* the cupula and ovaries are in a young state exactly like those of *L. caerulea*, but the cupula does not become fleshy and splits at maturity disclosing the red berries. From this section the *Vesicariae* of Komarov do not differ; they were supposed to have a cupula adnate to the base of the calyx and growing with the ovaries into a rather dry collective fruit. This, however, is not the case, as good and complete material which I had recently the opportunity to examine, has shown. Franchet who first made the erroneous statement in regard to his *L. Ferdinandi* and Komarov who made it in regard to his *L. vesicaria* were deceived as well as myself by the fact that the top of the cupula adheres so

firmly to the base of the calyx and the neck of the ovaries by means of a dense matted villous tomentum with which the cupula and the top of the ovary is clothed, that even in thin sections they can only be separated by some force. Furthermore fully ripe fruits were not known at the time of the description of these species and the half-ripe berries had the appearance of a perfectly closed rather dry fruit, while material recently received showed that in both species the cupula splits at maturity and discloses the red berries.

Among the American *Loniceras* there is no other species which approaches *L. caerulea* in the shape and behavior of the bractlets; the nearest is *L. involucrata*, but in this species the bractlets though very large and growing with the fruits do not form a real cupula, they are only slightly connate and subtend, but do not enclose the berries. Among the Old World species, however, all intermediate states can be found from species with four small completely separate bractlets to species with a perfect cupula tightly enclosing the ovaries. There is even a species, *L. Griffithii* Hook. f. & Thoms., belonging to the subgenus *Periclymenum* in which all the bractlets of a whorl of six flowers are connate into one common cupula.

A few words may be added here on the morphology of the inflorescence in the genus *Lonicera*. The inflorescence is a simple three-flowered cyme with the central flower suppressed in the subgenus *Chamaecerasus*, while in the subgenus *Periclymenum* (*Caprifolium*) all three flowers are developed and the flowers of the two opposite sessile cymes form here six-flowered whorls. Each flower has two prophylls. The prophylls of the central flower bearing in their axils the two lateral flowers are called bracts; they are always present, though in a few cases as in *L. oblongifolia* and *L. conjugialis* very minute and caducous; in shape they vary from subulate to foliaceous. The prophylls of the lateral flowers of which there are four in each cyme, two for each flower, are designated as bractlets; they are generally roundish in outline and usually partly connate in various ways and different degrees, less often perfectly separate and sometimes entirely wanting or only recognizable as minute tubercles at the base of the ovaries. In most species of the subgenus *Periclymenum* and in a few other species the leaves subtending the cymes become bractlike, but must not be confused with the real bracts and bractlets.